Criterium validity of the Kinect Balance Test

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Aim: Determine whether Kinect-V2 is an accurate measurement tool for mapping the movement of the centre of mass in the target group of elderly above the age of 65.The movement of the centre of mass is an important clinical measure for balance. The...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Observational non invasive

Summary

ID

NL-OMON45354

Source
ToetsingOnline

Brief title
KBT validity

Condition

- Other condition

Synonym
balance, postural stability

Health condition

Balans, posturale stabiliteit, valpreventie

Research involving
Human

Sponsors and support

Primary sponsor: Kinetic Analysis
Source(s) of monetary or material Support: Regio West Brabant

Intervention

Keyword: balance, center of mass (CoM), kinect

Outcome measures

Primary outcome

The primary outcome measure is the movement trajectory of the centre of mass, which will be simultaneously measured by both Kinect-V2 and Vicon. The movement will be measured in 3 directions, along the X, Y and Z axes. All data collection will be visualised, by both systems, as a form of control. The centre of mass will be calculated using the Plug-In-Gait model 25 in the Vicon software. Kinect-V2 software will calculate the centre of mass using 20 body marks, as described by Gonzales in 2014.

The Kinect Balance Test will be executed once and documented by both systems simultaneously. The setup of the test is depicted in figure 3 and systematically described in the figure below. The validation process will be described in the chapter on statistical analysis.

Secondary outcome

Gender, age, length, weight and relevant chronical disorders.

Study description

Background summary

The numbers of elderly people are ever increasing, combined with the fact that elderly are more prone to fall, there is a need for a functional protocol that can help estimate the risk of falling in the elderly population. Previously, validity studies have been carried out, multiple elements of several balance tests have been used to compare the Kinect-V2 to the Vicon system, which is the current golden standard. Results from these studies show that Kinect-V2 could be used to screen balance. The movement of the centre of mass, measured by the Kinect, is an objective quantitative measurement used to qualify body sway. Body sway is used as a clinical measure to quantify balance and the risk of falling. In previous studies an increased body sway has been associated with an increased risk of falling. The Kinect camera provides interesting abilities that can be used to objectively depict balance and the risk of falling in a clinical setting. The population investigated in previous studies were healthy adults, without any balance restrictions. However, the recommendation would be to test the Kinect-V2 with individuals suffering from balance restrictions, due to the fact that these people are likely to have different movement patterns. The target group, elderly people suffering from balance restrictions, has not yet been investigated using the Kinect-V2.

Study objective

Aim: Determine whether Kinect-V2 is an accurate measurement tool for mapping the movement of the centre of mass in the target group of elderly above the age of 65.

The movement of the centre of mass is an important clinical measure for balance. The movement of the centre of mass is an objective quantitative measurement used to qualify body sway18,19. In previous studies an increased body sway has been associated with an increased risk of falling 20,21,22.

In the literature Vicon is considered the golden standard for measuring the movement of the centre of mass using optical movement analysis systems. However, Vicon is very costly, which prevents its use in the daily practice. If Kinect-V2 proves to be a less expensive, yet valid alternative, a new measurement tool will be available for the movement of the centre of mass that is easy to transport and available to a large group of (professional) users.

Primary objective
Can Kinect-V2 be considered a valid measurement tool for mapping the movement of the centre of mass in elderly above the age of 65.

Study design

This in a validity study, which will research the criteria validity of the measured movement in the centre of mass comparing the Kinect-V2 to the current golden standard, the Vicon system.

All participants will be given a certain time and date at which the test procedure will be completed under supervision and instruction of the researchers. Every participant will complete the procedure once, on a day in March, April or May, and it will take approximately 20 minutes.

Study burden and risks

The burden and risks are minimal, seeing only health elderly will be tested. The test will only have to be taken once, will only take 20 minutes and consists of relatively easy balance tests.

The subjects will have no direct benefit from participating in the research. However, they will also have no disadvantages. Risks are negligible.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

older than 65 years of age
able to stand independently without aid or other support
cognitively able to follow instructions

Exclusion criteria

understanding verbal instructions

Study design

Design

Study type: Observational non invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Diagnostic

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	08-05-2017
Enrollment:	50
Type:	Actual

Ethics review

Approved WMO

Date:	08-05-2017
Application type:	First submission
Review commission:	METC Brabant (Tilburg)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL60864.028.17